

SEP 29 1992

OCCASIONAL PAPERS

of the
MUSEUM OF NATURAL HISTORY
The University of Kansas
Lawrence, Kansas

NUMBER 151, PAGES 1-23

23 SEPTEMBER 1992

**THE STATUS OF THE HYLID FROG GENUS *OLOLYGN*
AND THE RECOGNITION OF *SCINAX* WAGLER, 1830**WILLIAM E. DUELLMAN AND JOHN J. WIENS¹

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ABSTRACT The hylid frog genus *Scinax* Wagler, 1830 (type species: *Hyla aurata* Wied-Neuwied, 1821) has priority over *Ololygon* Fitzinger, 1843 (type species: *Hyla strigilata* Spix, 1824). A neotype is designated for *Hyla aurata*, which is compared with other species of *Scinax*. The genus is defined using external morphological, osteological, larval, and reproductive characters. *Scinax* is considered to be monophyletic and the sister group of *Scarthyla*.

RESUMEN El género hílido *Scinax* Wagler, 1830 (especie tipo *Hyla aurata* Wied-Neuwied, 1821) tiene prioridad sobre el género *Ololygon* Fitzinger, 1843 (especie tipo *Hyla strigilata* Spix, 1824). Se designa un neotipo para *Hyla aurata*, el cual se compara con otras especies de *Scinax*. Se define el género usando caracteres morfológicos, osteológicos, larvales, y reproductivos. Se considera a *Scinax* monofilético y como el grupo hermano de *Scarthyla*.

Key words: Hylidae, Generic nomenclature, *Ololygon*, *Scinax*.

Prior to 1977, numerous species of neotropical *Hyla* were recognized as the *Hyla rubra* group by León (1969), Cochran and Goin (1970), and Duellman (1970a). Within this group, phenetic subgroups were recognized

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by Duellman (1972) and Lutz (1973). Fouquette and Delahoussaye (1977) resurrected the generic name *Ololygon* Fitzinger, 1843, for frogs of the *Hyla rubra* group (sensu lato). They included 48 species in five species groups of *Ololygon* and referred 10 other species to the genus. Unfortunately, Fouquette and Delahoussaye (1977) overlooked the fact that among the species they included in *Ololygon* was the type species of *Scinax* Wagler, 1830, which, as noted by Pombal and Gordo (1991), has priority over *Ololygon* Fitzinger, 1843.

Herein we provide (1) a discussion of the nomenclature relevant to the genus; (2) a definition of the genus *Scinax*, with a discussion of possible inter- and intrageneric relationships; and (3) a list of trivial names associated with the genus.

MATERIALS AND METHODS

We examined cleared-and-stained skeletal preparations of 34 species, preserved adults of 42 species, and larvae of 20 species of *Scinax*, and comparative material representing most genera of hylids and centrolenids in the collection of The University of Kansas Museum of Natural History (KU) (Appendix 1). Measurements were taken to the nearest 0.1 mm using needle-tipped calipers in the manner described by Duellman (1970a); snout-vent length is abbreviated as SVL. Formulae for toe webbing are based on Savage and Heyer (1967) as modified by Myers and Duellman (1982). Terminology of larval features follows Altig and Johnson (1989), and terminology for osteological features follows Duellman and Trueb (1986) and Trueb (1973). Acronyms for museum collections follow Leviton et al. (1985).

NOMENCLATURE

Scinax Wagler, 1830

Scinax Wagler, 1830:201.—Type species: *Hyla aurata* Wied-Neuwied, 1821, by subsequent designation (Stejneger, 1907:76).

Ololygon Fitzinger, 1843:31.—Type species: *Hyla strigilata* Spix, 1824, by monotypy.

Garbeana Miranda-Ribeiro, 1926:96.—Type species: *Garbeana garbei* Miranda-Ribeiro, 1926, by monotypy.

Generic names.—In his classification of amphibians, Wagler (1830) proposed many new generic names with a list of included species. On page 201 he erected the genus *Scinax* and listed three species—*S. aurata* (Wied-Neuwied, 1821), *S. variolosa* (Spix, 1824 [= *Hyla punctata*, fide Peters, 1872:214]), and *S. bipunctata* (Spix, 1824). Listing several species under a new generic name without designating a type species was a common practice in the 19th Century. Leonhard Stejneger made valiant efforts to

tidy up earlier nomenclature, and in his treatise on the herpetology of Japan, Stejneger (1907:76) provided a generic synonymy of *Hyla*, in which he listed "1830. *Scinax* Wagler, Syst. Amph., p. 201 (type, *H. aurata*)." In the same synonymy Stejneger also listed type species for two other nominal genera with lists of proposed included species. Schneider (1799) listed 11 species under *Calamita*; of these, Stejneger (1907) selected *Rana arborea* Linnaeus, 1758, as the type species. Wagler (1830) listed 11 species under *Auletris*; of these, Stejneger (1907) selected *Hyla boans* Linnaeus, 1758, as the type species. Similarly, of the seven species listed under *Hylaplesia* by Boie (1826), Stejneger (1937) chose *Hyla punctata* Daudin, 1802 (= *Calamita punctatus* Schneider, 1799) as the type species. All of these are valid subsequent designations of type species according to Article 69 of the International Code of Zoological Nomenclature (Anonymous, 1985).

In his list of genera of Hylidae, Fitzinger (1843:31) placed only one species in *Ololygon*—*Hyla strigilata* Spix, 1824. Miranda-Ribeiro (1926:96) described a new genus and species, *Garbeana garbei*. *Hyla strigilata* Spix, 1924, and *Garbeana garbei* are the type species of *Ololygon* Fitzinger, 1843, and *Garbeana* Miranda-Ribeiro, 1926, respectively, by monotypy. Thus, of the nominal species included in the *Hyla rubra* group (sensu lato, *auctororum*) and subsequently included in the genus *Ololygon* by Fouquette and Delahoussaye (1977) and Frost (1985), three of them are type species of genera. The earliest generic name is *Scinax* Wagler, 1830, with the type species *Hyla aurata* Wied-Neuwied, 1821. Therefore, the correct generic name for this group of hylid frogs is *Scinax* Wagler, 1830; *Ololygon* Fitzinger, 1843, and *Garbeana* Miranda-Ribeiro, 1926, are subjective junior synonyms.

The generic name, *Scinax*, is from the Greek *skinos* meaning quick or nimble, an appropriate name for these agile frogs. The gender is feminine.

Type species.—In order to justify the use of *Scinax* and the placement of the generic synonyms, it is necessary to identify biologically the type species of the genera. Thus, we are concerned with the identities of *Hyla aurata*, *Hyla strigilata*, and *Garbeana garbei*.

Garbeana garbei is readily identified. The holotype (MZUSP 277) was examined by Duellman, and many specimens are associated with this specific name (as *Hyla garbei*), a taxon widely distributed in the upper Amazon Basin (Duellman, 1970b; 1972).

It is unfortunate that *Hyla strigilata* Spix, 1824, is the type species of *Ololygon*, because the holotype, ZSM 2369/0 from "Bahia," was destroyed in World War II (Hoogmoed and Gruber, 1983). Peters (1872) examined the type specimen ("Das einzige Original-exemplar") and noted discrepancies between it and Spix's illustration (1824:pl. X, fig. 3). Cochran (1955) examined the holotype of *H. strigilata* and associated many specimens

from eastern Brazil with the species, which she considered to be polytypic; she included *Hyla brienii* de Witte, 1930, and *Hyla flavoguttata* Lutz and Lutz, 1939, as subspecies. Cochran's concept of *Hyla s. strigilata* apparently included two or more species; she provided photographs (1955:pl. 14, figs. D, E) of a preserved specimen (ZMB 7504) from Caravellas, Bahia, Brazil. Lutz (1973) also was unsure of the identity of *Hyla strigilata* and tentatively referred only four specimens, all juveniles from Afonso Claudio, Espírito Santo, to the species. Thus, the identity of *Hyla strigilata* remains questionable; presumably the name applies to a species in Bahia, Brazil, possibly one that is recognized by another name. However, based on the descriptions of the type by Spix (1824) and Peters (1872) and the illustration in Spix (1824), *Hyla strigilata* is distinct from *Hyla aurata*.

Wied-Neuwied (1821:249) described *Hyla aurata* from an unknown number of specimens taken in swamps at Santa Agnes, Bahia, Brazil. Wied-Neuwied (1824:531–533) provided a more detailed description. English translations of both descriptions were given by Lutz (1973:167–168). Bokermann (1957) traced Wied-Neuwied's travels in Brazil and listed Wied-Neuwied's locality as "Santa Inez, fazenda (S. Agnes). Atualmente cidade de Santa Inez, BA, proxima ao rio Jequiçá." Bokermann (1966) gave the type locality of *Hyla aurata* as "Santa Inéz (= 'S. Agnes'), Bahia."

In 1965, the species was rediscovered at Maracás, Bahia, Brazil (Bokermann, 1969). Lutz (1973) did not mention Bokermann's locality, but noted that she had found *Hyla aurata* in 1941 at Salvador and at Cachoeira, near São Felix, on the Rio Paraguassú. Thus, the species has been reported from four localities from Salvador on the Atlantic coast to Maracás, about 160 km inland; all localities are between 12°30' and 13°26' S latitude.

As was characteristic of the early 19th century, no type specimens were designated, and no types are known to exist. Some of Wied-Neuwied's types of frogs (e.g., syntype of *Hyla crepitans*) are in the American Museum of Natural History, but there is no evidence for the existence of type specimens of *Hyla aurata* in that collection (Bokermann, 1969; D. R. Frost, pers. comm.). In the interests of nomenclatural stability, we designate a neotype of *Hyla aurata* Wied-Neuwied, 1821.

Rules for the designation of neotypes are explicit in Article 75.d of the International Code of Zoological Nomenclature (Anonymous, 1985); these include (1) evidence that the neotype is consistent with what is known of the former name-bearing type; (2) evidence that the neotype came as nearly as practical from the original type locality; and (3) that the neotype is the property of a recognized scientific institution. Extant specimens of *Hyla aurata* are from three localities; of these, Maracás is the closest to the type locality. Maracás is about 70 km (airline) WSW of Santa Inéz (= Santa Agnes, the stated type locality); both localities are inland. Maracás is at the headwaters of the Rio Jequiçá, and Santa Inéz is in the valley of the same

river. The other localities, Cachoeira and Salvador, are on the coastal plain, about 125 km NE and 150 km ENE (airline), respectively, from Santa Inéz. The species was first found at Maracás in September 1965 by F. M. Oliveira, and additional specimens were collected there by F. M. Oliveira and W. C. A. Bokermann in November 1965. These specimens (WCAB 30726–36, 31857–906) were deposited in Bokermann's private collection in São Paulo, Brazil. One of these specimens, WCAB 31905, was donated to the Museum of Natural History, The University of Kansas, in 1969. This specimen satisfies all the requirements for designation as a neotype. Thus, KU 125383 hereby is designated as the neotype of *Hyla aurata* Wied-Neuwied, 1821. According to Article 75.f of the code, the place of origin of the neotype becomes the type locality. Therefore, the type locality of *Hyla aurata* becomes Maracás, Estado do Bahia, Brasil.

Description of neotype.—Adult male; body moderately robust; head as wide as body, longer than wide; head length 36.4% of SVL; head width 32.5% of SVL; snout long, projecting well beyond margin of jaw, subacuminate in dorsal view and in profile; eye–nostril distance slightly greater than horizontal diameter of eye; canthus rostralis rounded; loreal region slightly concave; lips rounded. Top of head flat; interorbital distance about twice width of upper eyelid; nostrils barely protuberant dorsolaterally at point above anterior margin of lower jaw; internarial area barely depressed. Supratympanic fold weak, barely obscuring upper edge of tympanic annulus; tympanum round, posteroventral to eye; separated from eye by distance equal to 77% of diameter of tympanum.

Forearm moderately robust; row of low ulnar tubercles; fingers short, unwebbed, bearing large, elliptical, terminal discs; width of disc on Finger III 85% diameter of tympanum; relative lengths of fingers I < II < IV < III; basal segment of Finger II greatly swollen. Palmar tubercle elevated, bifid; thenar tubercle low, elliptical; large, unpigmented nuptial excrescence on inner edge of thumb; subarticular tubercles conical; supernumerary tubercles subconical, present only on proximal segments of digits. Hind limb moderately robust; tibia length 57.0% of SVL; foot length 41.6% of SVL; numerous subconical tubercles on heel; rows of distinct tubercles on both inner and outer edges of tarsus; inner tarsal fold absent; inner metatarsal tubercle elliptical, elevated; outer metatarsal tubercle conical. Toes moderately long, bearing elliptical discs nearly as large as those on fingers; relative lengths of toes I < II < III = V < IV; toes about three-quarters webbed; webbing formula I 2—2 II 1+—2 III 1+—2 IV 2—1+ V; subarticular tubercles conical, smaller than those on fingers; supernumerary tubercles small, subconical, only on proximal segments of digits.

Skin on dorsal surfaces of head and limbs smooth, on dorsal surfaces of body shagreened, on flanks weakly granular; numerous small tubercles on upper eyelids and dorsal surfaces of body and shanks; skin on belly and

ventral surfaces of thighs coarsely granular, on other ventral surfaces smooth. Cloacal opening directed posteroventrally at upper level of thighs; cloacal sheath short, unmodified. Vomerine odontophores slightly elevated, elliptical, slightly inclined posteromedially between ovoid choanae, narrowly separated medially, each bearing five teeth. Tongue broadly cordiform, shallowly notched posteriorly, barely free behind. Vocal slit elliptical, extending from midlateral base of tongue toward angle of jaws; vocal sac single, median, subgular, large, extending onto chest.

Coloration in preservative: Dorsum tan with cream dorsolateral stripes extending from occiput immediately behind orbits to groin; stripe on left side interrupted and offset in scapular region; stripes bordered by series of small brown spots (Fig. 1). Canthal stripe brown, diffuse; interorbital bar brown, distinct, narrow, bordered anteriorly by much wider cream bar; upper lips and tympanum creamy tan. Three indistinct, transverse brown bars on each forearm; anterior and dorsal surfaces of thighs indistinctly mottled creamy tan and brown; posterior surfaces of thighs brown; dorsal shanks tan with indistinct brown spots and transverse bars; hands, feet, and venter creamy tan.

Structurally, this specimen agrees with the original description by Wied-Neuwied (1921) and the description of the series from Maracás by Bokermann (1969). The color pattern of the neotype is less bold than that of the adult female illustrated by Bokermann (1969).

Measurements (in mm): SVL 22.8, tibia length 13.0, foot length 9.5, head length 8.3, head width 7.4, internarial distance 1.6, interorbital distance 3.2, upper eyelid 1.8, eye-nostril 2.7, eye diameter 2.6, eye-tympanum 1.0, tympanum diameter 1.3. According to Bokermann (1969), the SVL of nine calling males is 23–25 mm (\bar{x} = 23.7) and of seven gravid females, 23–24 (\bar{x} = 23.7).

Comparisons.—In comparison with other species of *Scinax* in north-eastern Brazil (Espírito Santo northward), *S. aurata* differs from *S. nebulosa* by lacking conical ulnar, tarsal, heel, and labial tubercles and bold black and off-white mottling on the posterior surfaces of the thighs. From *S. emydice*, *S. rubra*, and *S. x-signata*, it differs by its smaller size (SVL of adult males < 25 mm vs. > 40 mm) and its lack of pale spots enclosed by dark brown or black on the posterior surfaces of the thighs. *Scinax strigilata* also is larger (holotype, 42 mm; Peters, 1872:216) and lacks dorsolateral stripes (Spix, 1824:pl. 10, fig. 3). *Scinax argyreornata*, *S. catharinae*, *S. flavoguttata*, and *S. heyeri* differ from *S. aurata* in having bold transverse bars across the hind limbs, shorter and higher rostra, and in lacking pale dorsolateral stripes. *Scinax boesemani* has smooth skin and is uniform tan dorsally (except for a dark canthal-supratympanic stripe and a few small, brown flecks on the dorsum). *Scinax crospeodospila* is larger (adult males > 28



Fig. 1. Neotype of *Hyla aurata* Wied-Neuwied, 1821; KU 125383, adult male, 22.8 mm SVL.

mm SVL), lacks pale dorsolateral stripes and an interorbital bar, and has a dorsum with elongate, dark brown blotches.

Lutz (1973) noted the similarity in coloration of *S. cuspidata* with Wied-Neuwied's (1821; 1824) descriptions of *Hyla aurata*. *Scinax cuspidata* is about the same size as *S. aurata* and has a similar dorsal coloration (Fig. 2), except that brown and cream interorbital bars are absent. *Scinax aurata* also differs from *S. cuspidata* in having distinct, cream tubercles on the dorsal surface of the shank. The coloration of *S. aurata* also resembles that of two other small species, *S. exigua* and *S. fuscomarginata*. *Scinax exigua* is smaller (adult males to 23 mm SVL) and has a smooth dorsum. *Scinax fuscomarginata* lacks a pale interorbital bar and tubercles on the dorsal surface of the shank.



Fig. 2. Variation in dorsal color pattern in *Scinax cuspidata*. Left to right: KU 92008, 92006, 92007, 92005, all from Barro São João, Rio de Janeiro, Brazil.

Remarks.—Bokermann (1969) provided some ecological and behavioral data for the species. Individuals were found in terrestrial and epiphytic bromeliads. With the first rains of the season in November, males called from hidden perches on bushes and the stems of grasses within 1 m of temporary ponds. The call consists of a single note repeated at a rate of about 12 notes/s. Each note has a duration of about 0.2 s and consists of 9 pulses; the dominant frequency is at about 2000 Hz. A testis removed from the neotype contained no sperm (M. J. Fouquette, Jr., pers. comm.).

GENUS *SCINAX* WAGLER, 1830

Diagnosis.—We tentatively consider the following three character states to be synapomorphies of the genus: (1) loreal region depressed; (2) discs on hand truncate, wider than long; (3) webbing between first and second toes reduced (absent or reduced to fringe along inner margin of second toe) relative to webbing on other toes (Fig. 3).

Definition.—(1) Frontoparietal fontanelle variably exposed; (2) prootic and exoccipital fused in adults; (3) nasal slender, length 20–40% of skull length, not in contact with maxilla or frontoparietal, well separated from pars facialis of maxilla in most species, articulating medially in a few species (e.g., *S. acuminata*, *S. nasica*); shape of maxillary process continuously variable from long and pointed (e.g., *S. squalirostris*) to short and rounded (e.g., *S. cuspidata*); (4) sphenethmoid well ossified; longer than wide in dorsal aspect; (5) alary process of premaxilla inclined anterodorsally; (6) quadratojugal long, slender, articulating with maxilla; (7) palatine process of maxilla usually present; (8) maxillary, premaxillary, and vomerine teeth small, blunt, pedicellate, always present; (9) vomerine odontophore transverse, not angular; (10) neopalatine (terminology of Trueb, 1992) usually present (absent in *S. parkeri*; variably present in *S. staufferi*), well developed, articulating with maxilla; (11) cultriform process of parasphenoid wide posteriorly, narrowing abruptly anterior to optic foramen, usually terminating posterior to level of neopalatine; parasphenoid

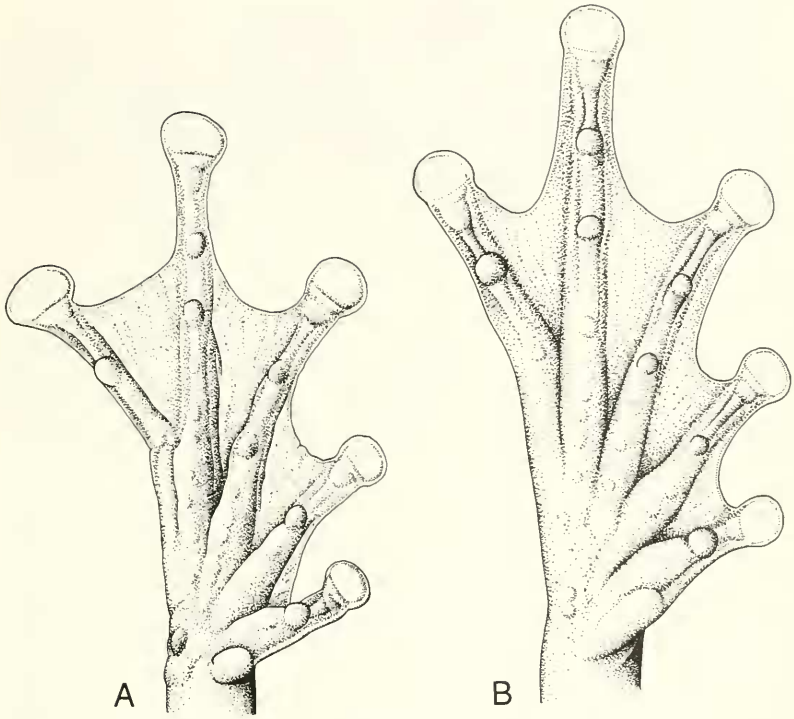


Fig. 3. Feet of hyloid frogs. A. *Scinax rubra*, KU 109471, showing characteristic reduction of webbing between Toes I and II. B. *Hyla microcephala*, KU 101606, showing primitive pattern of webbing between Toes I and II. Reproduced from Duellman, 1970a.

alae short, narrow, oriented posterolaterally; (12) pterygoid well developed, median ramus almost in contact with prootic; (13) ventral ramus of squamosal bowed anterodorsally in lateral aspect; otic ramus expanded into otic plate on crista parotica; zygomatic ramus acuminate, usually extending 50% of distance between ventral ramus and postorbital process of maxilla (estimated by projecting a straight line from the zygomatic ramus to the maxilla), but ranging from 20% (e.g., *S. nebulosa*) to 75% (e.g., *S. x-signata*); (14) skull lacking dermal exostosis, co-ossification, casquing, and neomorphic dermal elements; (15) septomaxilla Type II (Trueb, 1970); (16) coronoid process of angulosplenic present, weakly developed; (17) posterolateral and anterolateral processes of hyoid always present; short anterior processes present on hyale; posteromedial processes long and ossified; commonly some calcification of hyoid plate posteriorly (Fig. 4); (18) plectral apparatus always present; pars externa plectri ori-

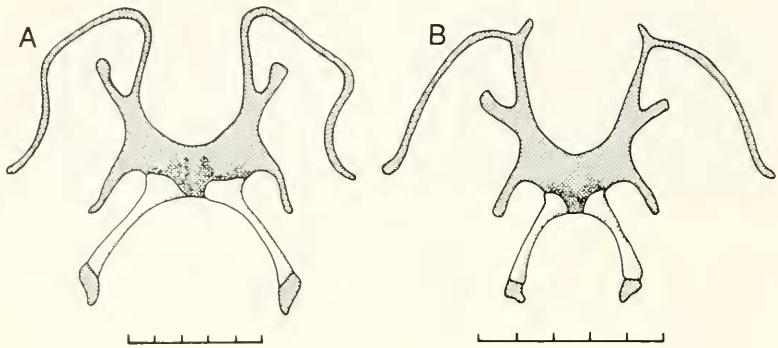


Fig. 4. Hyoids of hylid frogs. **A.** *Smilisca phaeota*, KU 169627, showing absence of anterior process of hyale. **B.** *Scinax rubra*, KU 123048, showing presence of anterior process of hyale. Scale = 5 mm.

ented ventrally, elongate and not dilated distally in most species, entering tympanic ring dorsally; tympanic annulus large, occupying most of area between quadratojugal and zygomatic ramus of squamosal; (19) eight procoelous nonimbricate presacral vertebrae: atlas Type I (Lynch, 1973) (widely spaced cotyles); transverse processes of Presacral Vertebra IV not elongated posteriorly; processes of Presacral Vertebra VIII usually inclined anteriorly; sacral diapophyses weakly dilated; sacrococcygeal articulation bicondylar (Fig. 5); (20) omosternum and sternum always present, calcified in some specimens; suprascapula (cleithrum) bifurcate distally; (21) prepollex not enlarged or ossified; (22) intercalary elements between ultimate and penultimate phalanges cartilaginous, not mineralized in most species (mineralized in *S. argyreornata*, *S. berthae*, and *S. squalirostris*); (23) adult size small to moderate, ranging from 18 mm in adult male *S. exigua* (Duellman, 1986) to 53 mm in adult female *S. boulengeri* (Duellman, 1970a); (24) coloration generally dull, with bold coloration on posterior surface of thighs in some species; (25) palpebral membrane clear; (26) skin smooth, shagreened, or tuberculate (with large tubercles on snout, mouth, and limbs in some species); otherwise lacking dermal folds, appendages, membranes, or glands; (27) head longer than wide; (28) snout protruding, usually long, with depressed loreal region; (29) vocal sac single, median, subgular in most species, but paired, lateral, subgular in *S. jureia*, *S. ranki*, and *S. rizibilis* (Andrade and Cardoso, 1987; Pombal and Gordo, 1991); (30) toes about one-half to three-quarters webbed; webbing reduced between first and second toes (relative to extent of webbing on other toes); fingers unwebbed or only webbed basally; (31) outer metatarsal tubercle typically present in all species; (32) digital disks of hand dilated, truncate, wider than long; (33) nuptial excrescence inconspicuous

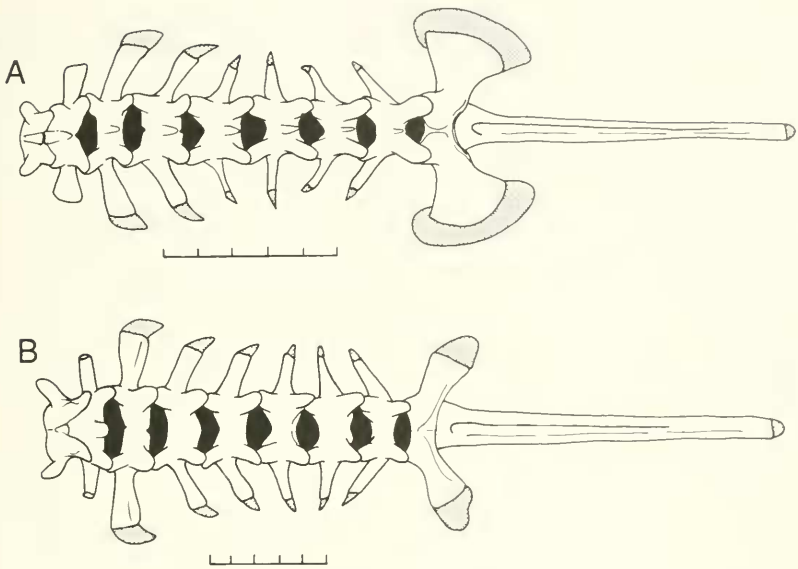


Fig. 5. Vertebral columns of hylid frogs. A. *Phrynohyas venulosa*, KU 92261, showing widely dilated sacral diapophyses. B. *Scinax x-signata*, KU 150871, showing narrow sacral diapophyses. Scale = 5 mm.

(generalized type of Duellman, 1970a) or absent; (34) depressor mandibulae with single slip; adductor m. posterior subexternus present (Starrett, 1968; data only for *S. elaeochroa* and *S. rubra*); (35) m. intermandibularis absent; submandibular bilobular extensions of the interhyoideus present in some species (Tyler, 1971); (36) sperm with two tail filaments (Fouquette and Delahoussaye, 1977); (37) diploid chromosome number 24 (Fouquette and Delahoussaye, 1977); (38) tadpoles with body relatively short posterior to orbit; eyes large, lateral, widely spaced in most species; tail usually deep and tapering to tip; dorsal fin extending onto body in most species; oral disc anteroventral; tooth row formula 2/3; marginal oral papillae with dorsal gap (except in members of the *S. catharinae* group); ventral papillae interrupted in *S. crosopedospila* (Heyer et al., 1990) and interrupted by "labial arm" (muscular support for ventralmost tooth row) in most members of *S. rostrata* group; (39) mating call consisting of single pulsed note or series of short notes (Cardoso and Sazima, 1980; Duellman, 1970a, 1972; Peixoto and Weygoldt, 1987); (40) eggs deposited in standing water, streams (*S. catharinae* group), or in terrestrial bromeliads (*S. perpusilla* group; Peixoto, 1988a).

Content.—Subsequent to Fouquette and Delahoussaye's (1977) recognition of *Ololygon*, new taxa have been named as *Ololygon* (*O. trilineata*

Hoogmoed and Gorzula, 1979; *O. danae* and *O. exigua* Duellman, 1986; *O. atrata* and *O. melloi* Peixoto, 1988a; *O. chiquitana* de la Riva, 1990; *O. pedromedinae* Henle, 1991); some formerly nominal taxa have been resurrected from synonymies and recognized as species of *Ololygon* (e.g., *O. v-signata* Peixoto, 1987; *O. alcatraz* Peixoto, 1988b). However, Almeida and Cardoso (1985) considered that variation in sperm morphology within *Ololygon* was too great to allow its use in defining the genus. Thus, other new species were named as *Hyla* (e.g., *H. maracaya* Cardoso and Sazima, 1980; *H. canastrensis* Cardoso and Haddad, 1982; *H. agilis* Cruz and Peixoto, 1983; *H. ranki* Andrade and Cardoso, 1987; *H. jureia* and *H. littoralis* Pombal and Gordo, 1991). Frost (1985) listed 54 species in *Ololygon* (= *Scinax*); two species listed by Frost (1985) in *Hyla* (*Hyla albicans* Bokermann, 1967, and *Hyla ariadne* Bokermann, 1967) obviously belong in the genus. *Hyla vigilans* Solano, 1971, may belong to the genus (Frost, 1985:157). Subsequently, 12 new species have been described, three have been resurrected from synonymies, and one has been synonymized. Thus, the total number of recognized species in the genus now is 70. More than 100 trivial names apply to species of *Scinax* (Appendix II).

Distribution.—The genus ranges from Mexico (Guerrero and Tamaulipas) through Central America to northern Uruguay and northern Argentina east of the Andes, to extreme northern Peru west of the Andes, and the Caribbean islands of Tobago, Trinidad, and St. Lucia. Most species occur in lowland rainforest, dry forest, or savanna at elevations of less than 500 m, but several species range to elevations of 1000 m in eastern Brazil, and an undescribed species ranges above 2000 m in the Andes of Peru (Duellman and Wiens, in prep.). The genus is most diverse in southeastern Brazil (Espírito Santo to Minas Gerais and São Paulo).

DISCUSSION

Definition of *Scinax*.—Some discrepancies exist between our characterization of *Scinax* and other reports. According to our observations, the nasals are commonly less than 40% of the total skull length (vs. more than 40% in León, 1969, and Duellman, 1970a), and do not always have long, pointed maxillary processes (contra León, 1969, and Duellman, 1970a). Furthermore, the maxillary process of the nasal does not contact the maxilla in any of the species of *Scinax* we have examined (contra Duellman and de Sá, 1988). The presence of the palatine process of the maxilla varies both inter- and intraspecifically in *Scinax* (contra León, 1969, and Duellman, 1970a). According to Duellman and de Sá (1988), members of *Scinax* lack neopalatines (terminology of Trueb, 1992), but according to our observations, the neopalatines are present in all species except *S.*

parkeri and in some individuals of *S. staufferi*. Duellman and de Sá (1988) indicated that all members of *Scinax* have cartilaginous intercalary elements, however, we have observed mineralized intercalary elements in *S. argyreornata*, *S. berthae*, and *S. squalirostris*. As noted by León (1969), Duellman (1970a), and Duellman and de Sá (1988), the zygomatic ramus of the squamosal usually extends about 50% of the distance between the squamosal (dorsal head of ventral ramus) and maxilla, but this process can be considerably shorter (20% in *S. nebulosa*) or longer (75% in *S. x-signata*). León (1969) and Duellman (1970a) considered the sphenethmoid of *Scinax* to be wider than long, but our observations show that the sphenethmoid is actually longer than wide. The marginal oral papillae of the tadpole are complete in some species (in the *S. catharinae* group), rather than always having a dorsal gap as reported by Duellman (1970a). Also, a ventral gap in the marginal papillae may be present (e.g., *S. crospedospila*). We found nuptial excrescences to be present (although inconspicuous) on the prepollices of most male *Scinax*, whereas Duellman (1970a) stated that males lack nuptial excrescences.

Intergeneric relationships and monophyly.—The genus *Scinax* (as *Oloolygon* or *Hyla*) has been assigned to the subfamily Hylinae, a likely paraphyletic assemblage defined by the absence of the synapomorphies of the Hemiphractinae, Pelodyadinae, and Phyllomedusinae. Although relationships within the Hylinae are unclear, we consider it heuristic to speculate as to the relationships of *Scinax*. Our hypothesis is speculative because some of the character states that we postulate as derived occur in other hylid taxa and might prove to be plesiomorphic. We propose that *Scinax* belongs to a monophyletic group that includes the genera *Scarthyia* and *Sphaenorhynchus* (Fig. 6; numbered character states shown on tree correspond to numbers assigned to characters in following discussion). These three genera share numerous features, of which the following probably are derived (based on comparison with centrolenids and other hylids): (1) narrow (rather than strongly dilated) sacral diapophyses; (2) anteriorly inclined alary processes of the premaxillae; (3) tadpole with large, laterally placed eyes (polarity questionable; variable in *Scinax*).

According to Fouquette and Delahoussaye (1977), the only genera in the Hylinae with double-filamented sperm are *Scinax* and *Sphaenorhynchus* (but single-filamented in *Scarthyia*; M. J. Fouquette, pers. comm.). Based on the survey of these authors, the presence of double-filamented sperm seems to be a plesiomorphic character state in hylids (present in centrolenids, bufonids, some leptodactylids, and pelodyadine hylids). The presence of single-filamented sperm might be a synapomorphy uniting all hylids exclusive of pelodyadines and the clade containing *Scinax*, *Scarthyia* (in which single-filamented sperm would be a reversal), and *Sphaenorhynchus*, or double-filamented sperm might indicate a relation-

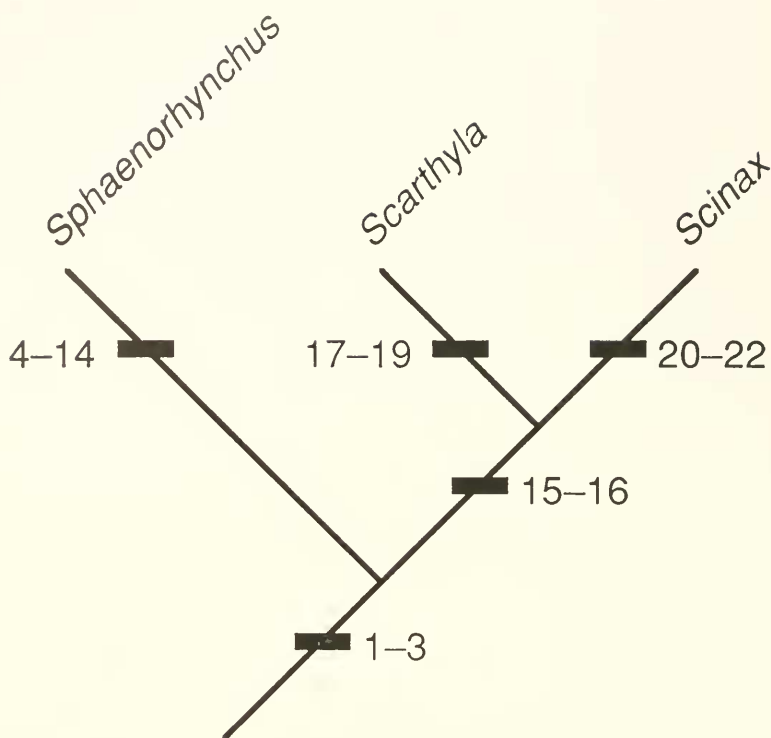


Fig. 6. Hypothesized phylogenetic relationships of three genera of hyloid frogs. Numbers by bars = character states numbered in text.

ship between *Scinax* and *Sphaenorhynchus* (exclusive of *Scarthyla*) if these genera are in fact more deeply nested within the Hylinae. Among these three genera, *Scinax* and *Scarthyla* share (15) reduced webbing on the hand (relative to webbing on the feet) and (16) the presence of an anterior process on the hyale (see Fig. 3, and Duellman and de Sá, 1988:fig. 2). All three genera are demonstrably monophyletic.

Members of *Sphaenorhynchus* examined share at least 11 synapomorphies (many of which are unique within the Hylidae): (4) posterior ramus of pterygoid absent; (5) zygomatic ramus of squamosal absent or reduced to small knob; (6) pars facialis of maxilla and alary process of premaxilla reduced; (7) postorbital process of maxilla reduced, not in contact with quadratojugal; (8) neopalatine reduced to sliver or absent (also in two species of *Scinax*); (9) pars externi plectri entering tympanic ring posteriorly (rather than dorsally); (10) pars externa plectri round; (11) hyale curved medially; (12) coracoids and clavicles elongate; (13) trans-

verse process of Presacral Vertebra IV elongate, oriented posteriorly; (14) prepollex ossified, bladelike.

The monotypic *Scarthyla* is diagnosed by three apomorphies involving the larvae: (17) tadpole elongate; (18) tadpole with labial arm (also in *Scinax rostrata* group); (19) tadpoles capable of launching themselves out of water. The presence of a single-filamented sperm and mineralized intercalary elements (also mineralized in *Scinax argyreornata*, *S. berthae*, *S. squalirostris*, *Sphaenorhynchus carneus* and *S. planicola*) also might be apomorphies diagnosing *Scarthyla*. The monophyly of *Scinax* is corroborated by at least three synapomorphies: (20) depressed loreal region; (21) webbing between first and second toes absent or reduced to fringe along margin of second toe; (22) discs on hand dilated, truncate, wider than long.

McDiarmid and Altig (1990) suggested that the presence of a larval labial arm could be a synapomorphy allying the genus *Scarthyla* with some members of the *Scinax rostrata* group. If this were true, *Scinax* would be paraphyletic with respect to *Scarthyla*. Although the labial arm is unique to these species, we suggest that the synapomorphies uniting the species of *Scinax* (listed above), species of the *Scinax rostrata* group (see below), and some (but not all) species of the *Scinax rostrata* group with other species of *Scinax* (slender, longitudinally oriented nasals; elongate, rod-shaped pars externa plectri, black bars on posterior of thighs; tuberculate skin; tadpoles with bodies that are short and deep posterior to the orbit and deep caudal fins that extend onto the body) indicate that the labial arm evolved independently in these two lineages.

Intragenetic relationships and taxonomy.—Seven species groups currently are recognized within *Scinax*. Most of the species groups within *Scinax* were recognized by Fouquette and Delahoussaye (1977) on the basis of sperm head "types." In this section we review the evidence for the monophyly of the species groups and provide updated lists of their contents.

The contents of the *Scinax catharinae* group were modified considerably by Peixoto and Weygoldt (1987). We follow their arrangement and also include *Scinax littoralis*, *S. machadoi*, and *S. opalina*. Thus, we consider the *S. catharinae* group to include the following species: *S. albicans*, *S. ariadne*, *S. argyreornata*, *S. brienii*, *S. catharinae*, *S. flavoguttata*, *S. heyeri*, *S. humilis*, *S. littoralis*, *S. machadoi*, *S. obtriangulata*, and *S. opalina*. The species for which reproductive and larval data are available share the derived features of oviposition in streams and tadpoles that lack a dorsal gap in the marginal labial papillae (*S. ariadne*, *S. flavoguttata*, *S. heyeri*, *S. machadoi*, *S. opalina*) or have the dorsal gap extremely reduced (*S. obtriangulata*, contra Heyer et al., 1990).

The species of the *Scinax catharinae* and *S. perpusilla* groups share short, truncate snouts (in dorsal view), a distinctive dorsal color pattern,

and known tadpoles having bluntly rounded snouts (features we presume to be derived). The *S. perpusilla* group was first recognized by Peixoto (1987) and includes the following species: *S. alcatraz*, *S. atrata*, *S. littorea*, *S. melloi*, *S. perpusilla*, *S. v-signata*. The species in this group share the synapomorphy of oviposition in terrestrial bromeliads.

The *Scinax rizibilis* group was recognized first by Andrade and Cardoso (1988) and contains three species (*S. jureia*, *S. ranki*, and *S. rizibilis*) sharing the synapomorphy of paired vocal sacs. The *S. rostrata* group was defined by Duellman (1972) and currently contains nine species: *S. boulengeri*, *S. epacrorhina*, *S. garbei*, *S. kennedyi*, *S. nebulosa*, *S. pedromedinae*, *S. proboscidea*, *S. rostrata*, and *S. sugillata*. All species in the group share an acuminate, depressed snout. Except for *S. nebulosa*, species for which tadpoles are known (*S. boulengeri*, *S. garbei*, *S. pedromedinae*, *S. rostrata*, *S. sugillata*) have fanglike teeth and a labial arm supporting the lowermost tooth row. All species except *S. kennedyi* and *S. rostrata* have conical ulnar, tarsal, and labial tubercles. Males of the *S. rostrata* group that we have observed (*S. garbei*, *S. pedromedinae*, *S. sugillata*), *S. boulengeri* (J. M. Ellingson, pers. comm.), and *S. rostrata* (J. D. Lynch, pers. comm.) often call in a head-down, vertical position; this unique behavior may be another synapomorphy of the group.

We are unaware of any evidence to support the monophyly of the remaining three species groups. The *Scinax rubra* group contains 10 species: *S. blairi*, *S. chiquitana*, *S. cynocephala*, *S. elaeochroa*, *S. funerea*, *S. fuscovaria*, *S. hayii*, *S. quinquefasciata*, *S. rubra*, and *S. similis*. The *S. stufferi* group contains 13 species: *S. agilis*, *S. baumgardeneri*, *S. berthae*, *S. danae*, *S. exigua*, *S. fuscomarginata*, *S. goinorum*, *S. nasica*, *S. parkeri*, *S. squalirostris*, *S. stufferi*, *S. trilineata* (not listed in the group by Frost, 1985, but related to *S. squalirostris*, according to the original description), and *S. wandae*. The *S. x-signata* group contains six species: *S. acuminata*, *S. boesemani*, *S. crosopedospila*, *S. cruentomma*, *S. cuspidata*, and *S. x-signata*. The remaining 11 species are unassigned to species groups: these are *S. alleni*, *S. aurata*, *S. canastrensis*, *S. duartei*, *S. ehrhardti*, *S. eurydice*, *S. longilinea*, *S. maracaya*, *S. pachychrus*, *S. strigilata*, and *S. trachythorax*.

Acknowledgments: This study was ancillary to a review of the *Scinax* in Amazonian and Andean Ecuador and Peru, which is part of a project on patterns of speciation and biogeography of Andean anurans supported by a grant (BSR-8805920) from the National Science Foundation (William E. Duellman, principal investigator). We are grateful to Janna M. Ellingson, Darrel R. Frost, John D. Lynch, and Linda Trueb for helpful information; M. J. Fouquette, Jr. for information on sperm morphology; Amy Lathrop for the drawings; and John E. Simmons for the photographs.

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APPENDIX I

SPECIMENS EXAMINED FOR DEFINITION OF *SCINAX*

Unless otherwise noted, all specimens are in the collection of The University of Kansas Museum of Natural History (KU). Cleared-and-stained skeletal preparations are noted by AA for Alizarin-red and Alcian-blue stained specimens and AR for specimens stained for Alizarin-red only.

Acris crepitans 158146 (AA). *Agalychnis callidryas* 77495 (AA). *Anotheca spinosa* 71122, 86900 (AA). *Aparasphenodon brunoii* 152227, 92213 (AA). *Aplastodiscus perviridis* 92722, 92723 (AA). *Argenteohyla siemseri* 116935, 116937 (AA). *Calyptahyla crucialis* 192471. *Centrolene geckoideum* 164491, 178017 (AA). *Centrolenella audax* 178028 (AA). *Centrolenella balionota* 164713 (AA). *Centrolenella buckleyi* 178059. *Centrolenella grandisonae* 164685 (AA). *Centrolenella griffithsi* 118026, 118028 (AA). *Corythomantis greeningi* 125380.

Cryptobatrachus sp. 203998 (AA). *Gastrotheca plumbea* 202699 (AA). *Gastrotheca rebecca* 196814 (AA). *Hemiphractus proboscideus* 123154 (AA). *Hyla albopunctata* 91933. *Hyla andersoni* 207334 (AA). *Hyla aperomea* 212086, 212087 (AA). *Hyla arborea* 148625. *Hyla bistincta* 140241. *Hyla boans* 166770, 150025 (AA). *Hyla bogotensis* 125363. *Hyla bromeliacia* 194224. *Hyla carnifex* 136210. *Hyla circumdata* 152233. *Hyla ebraccata* 77112. *Hyla fasciata* 205477 (AA). *Hyla geographica* 124171 (larvae). *Hyla granosa* 109496 (AA). *Hyla gratiosa* 116934 (larvae). *Hyla hazelae* 100969. *Hyla lanciformis* 104910 (AA), 152541 (larvae). *Hyla marmorata* 126433, 152455 (AA). *Hyla melanomma* 136795 (AA). *Hyla microcephala* 71242. *Hyla miliara* 101610. *Hyla minuta* 150308. *Hyla miotypanum* 200808. *Hyla parviceps* 205632 (AA). *Hyla phyllognatha* 180355 (larvae). *Hyla picta* 64873. *Hyla pictipes* 103691. *Hyla pinorum* 135225. *Hyla pseudopuma* 36599. *Hyla pulchella* 182961 (AA). *Hyla sumichrasti* 57882. *Hyla taeniopus* 53827. *Litoria caerulea* 204667 (AA). *Nyctinantis rugiceps* 152476. *Osteocephalus leprieurii* 153390. *Osteocephalus taurinus* 175501 (AA), 124238 (larvae). *Osteopilus dominicensis* 84701 (AA). *Osteopilus septentrionalis* 87932, 55173 (larvae). *Pachymedusa dacinicolor* 78453 (AA). *Phrynohyas venulosa* 215379, 92261 (AA), 104189 (larvae). *Phyllodytes luteolus* 74250. *Phyllomedusa tomopterna* 200512 (AA). *Plectrohyla glandulosa* 209699 (AA). *Plectrohyla quecchi* 190244. *Pseudacris clarkii* 207238, 207419 (AA). *Pseudacris triseriata* 207482 (AA). *Pternohyla fodiens* 75395, 60385 (AA). *Ptychohyla spinipollex* 64128, 192890 (AA). *Scarthyta ostinodactyla* 215413, 205773–74 (AA), 205865 (larvae).

Scinax acuminata 128916 (AR), 128917–21. *Scinax argyreornata* 91947, 148435–36, 148437 (AA). *Scinax aurata* 125383. *Scinax baungardneri* 129753. *Scinax berthae* 91948 (AR), 91949–53. *Scinax blairi* 138215. *Scinax boesemani* 69745, 69764–69, 128357–58 (AA). *Scinax boulengeri* 64328 (AR), 87774 (AR), 102174–77, 103618–20 (AA), 104295 (larvae). *Scinax catharinae* 92184–86, 92188–89 (AR), 92306 (AA). *Scinax chiquitana* 217293–94, USNM 312659 (AA). *Scinax crospeospila* 91992–95, 91996 (AR). *Scinax cruentomma* 11930–53, 152980–82 (AR), 152984–85 (AR), 111928 (AA), 109491 (larvae). *Scinax cuspidata* 92001–03 (AR), 92005–08. *Scinax danae* 167088–91, 167769–70 (AR). *Scinax duartei* 92018 (AR), 92019–22. *Scinax elaeochroa* 68281–91 (AR), 68390 (larvae), 87772–73 (AR), 96009–12. *Scinax epacrorrhina* 139242–45, 139247, 139249. *Scinax exigua* 167117–20, 167771–73 (AR). *Scinax flavoguttata* 92027, 92028 (AR). *Scinax funerea* 105168–79, 152979 (AR), 150148 (AA), 152559–60 (larvae). *Scinax fuscomarginata* 92029–31, 92034 (AR). *Scinax fuscovaria* 160336, 182897–99, 182900–01 (AA), 185809. *Scinax garbei* 150176–28, 152986–91 (AR), 153257 (larvae). *Scinax goinorum* 179004. *Scinax hayii* 92049–51, 92052 (AA). *Scinax humilis* 112376. *Scinax littorea* 218436 (larvae). *Scinax machadoi* 152330–31, 152332 (larvae). *Scinax madeirae* 92066–67, 92068 (AA). *Scinax melloi* 218438 (larvae). *Scinax nasica* 92107 (AR), 160423. *Scinax nebulosa* 91917 (AR), 127988–89 (AR), 128365–66, 130154 (larvae). *Scinax obtriangulata* 152240, 211301 (larvae). *Scinax pachychrus* 100344–45, 100346 (AA). *Scinax parkeri* 92117–18 (AR), 127845–48 (AA), 128552–54, 130152 (larvae). *Scinax pedromedinae* 205304–36, 205337–38 (AA), 205859 (larvae). *Scinax perpussilla* 92119–23, 92124 (AR), 218435 (larvae). *Scinax proboscoidea* 140900. *Scinax quinquefasciata* 218470–79, 166317 (AR), 202967 (larvae). *Scinax rizibilis* 92144–45. *Scinax rostrata* 77687

(AR), 101586–90, 104244 (larvae). *Scinax rubra* 109469–90, 123049 (AA), 74280 (AR), 152972–77 (AR), 109492 (larvae). *Scinax squalirostris* 92172–75, 92176–77 (AR), 197304 (larvae). *Scinax staufferi* 59924–27 (AR), 68614–15 (AR), 104162 (larvae), 136971–77. *Scinax trachythorax* 80862–64. *Scinax v-signata* 218437 (larvae). *Scinax wandae* 131717. *Scinax x-signata* 128517–20, 150871–72 (AA).

Smilisca baudinii 60415 (AA), 71722 (larvae). *Smilisca sila* 91833 (larvae). *Smilisca phaeota* 133462, 169627 (AA). *Sphaenorhynchus bromelicola* 124668. *Sphaenorhynchus carneus* 146576–81, 183709 (AA). *Sphaenorhynchus dorisae* 178825 (AA), 180982 (larvae). *Sphaenorhynchus lacteus* 178826–37, 202769, 92288 (AA), 205458 (AA). *Sphaenorhynchus orophilus* 74308–74309, 92295–96. *Sphaenorhynchus planicola* 92297–99, 92300 (AA). *Stefania evansi* 181125 (AA). *Trachycephalus jordani* 164484. *Triprion petasatus* 71736 (larvae). *Triprion spatulatus* 71744 (AA), 73841.

APPENDIX II

SPECIES-GROUP NAMES ASSOCIATED WITH THE GENUS *SCINAX* AND THEIR CURRENT STATUS

Trivial name, Original combination, Author, and Date	Current status
<i>acuminata</i> (<i>Hyla</i>), Cope, 1862 ¹	<i>S. acuminata</i>
<i>affinis</i> (<i>Hyla</i>), Spix, 1824	<i>S. x-signata</i>
<i>agilis</i> (<i>Hyla</i>), Cruz and Peixoto, 1983	<i>S. agilia</i>
<i>alcatraz</i> (<i>Hyla catharinae</i>), B. Lutz, 1973	<i>S. alcatraz</i>
<i>albicans</i> (<i>Hyla</i>), Bokermann, 1967	<i>S. albicans</i>
<i>alleni</i> (<i>Scytopsis</i>), Cope, 1870	<i>S. alleni</i>
<i>altae</i> (<i>Hyla</i>), Dunn, 1933	<i>S. staufferi</i>
<i>alterna</i> (<i>Hyla rubra</i>), B. Lutz, 1973	<i>S. rubra</i>
<i>angrensis</i> (<i>Hyla catharinae</i>), B. Lutz, 1973	<i>S. catharinae</i>
<i>argyreornata</i> (<i>Hylodes</i>), Miranda-Ribeiro, 1926	<i>S. argyreornata</i>
<i>ariadne</i> (<i>Hyla</i>), Bokermann, 1967	<i>S. ariadne</i>
<i>atrata</i> (<i>Ololygon</i>), Peixoto, 1988	<i>S. atrata</i>
<i>aurata</i> (<i>Hyla</i>), Wied-Neuwied, 1821	<i>S. aurata</i>
<i>baumgardneri</i> (<i>Hyla</i>), Rivero, 1961	<i>S. baumgardneri</i>
<i>berthae</i> (<i>Hyla</i>), Barrio, 1962	<i>S. berthae</i>
<i>blairi</i> (<i>Hyla</i>), Fouquette and Pyburn, 1972	<i>S. blairi</i>
<i>bocainensis</i> (<i>Hyla catharinae</i>), B. Lutz, 1968	<i>S. catharinae</i>
<i>boesemani</i> (<i>Hyla</i>), Goin, 1966	<i>S. boesemani</i>
<i>boulengeri</i> (<i>Scytopsis</i>), Cope, 1887	<i>S. boulengeri</i>
<i>brieni</i> (<i>Hyla</i>), DeWitte, 1930	<i>S. catharinae</i>
<i>caldarum</i> (<i>Hyla duartei</i>), B. Lutz, 1968	<i>S. duartei</i>
<i>camposseabrai</i> (<i>Hyla</i>), Bokermann, 1968	<i>S. x-signata</i>
<i>canastrensis</i> (<i>Hyla</i>), Cardoso and Haddad, 1982	<i>S. canastrensis</i>
<i>catharinae</i> (<i>Hyla</i>), Boulenger, 1888	<i>S. catharinae</i>

¹Citations appearing only in this list are not given in the literature cited.

Trivial name, Original combination, Author, and Date	Current status
<i>chiquitana</i> (<i>Oloolygon</i>), De la Riva, 1990	<i>S. chiquitana</i>
<i>coerulea</i> (<i>Hyla</i>), Spix, 1824	<i>S. x-signata</i>
<i>conirostris</i> (<i>Hyla</i>), Peters, 1863	<i>S. rubra</i>
<i>crospedospila</i> (<i>Hyla</i>), A. Lutz, 1925	<i>S. crospedospila</i>
<i>cruentomma</i> (<i>Hyla</i>), Duellman, 1972	<i>S. cruentomma</i>
<i>cryptanthus</i> (<i>Scytopsis</i>), Cope, 1874	<i>S. rubra</i>
<i>culex</i> (<i>Hyla</i>), Dunn and Emlen, 1932	<i>S. staufferi</i>
<i>cuspidata</i> (<i>Hyla</i>), A. Lutz, 1925	<i>S. cuspidata</i>
<i>cynocephala</i> (<i>Hyla</i>), Dumeril and Bibron, 1841	<i>S. cynocephala</i>
<i>danae</i> (<i>Oloolygon</i>), Duellman, 1986	<i>S. danae</i>
<i>depressiceps</i> (<i>Hyla</i>), Boulenger, 1882	<i>S. funerea</i>
<i>duartei</i> (<i>Hyla</i>), B. Lutz, 1951	<i>S. duartei</i>
<i>dulcensis</i> (<i>Hyla</i>), Taylor, 1958	<i>S. elaeochroa</i>
<i>egleri</i> (<i>Hyla</i>), B. Lutz, 1968	<i>S. nebulosa</i>
<i>ehrhardi</i> (<i>Hyla</i>), Müller, 1924	<i>S. ehrhardi</i>
<i>elaeochroa</i> (<i>Hyla</i>), Cope, 1876	<i>S. elaeochroa</i>
<i>epacrorrhina</i> (<i>Hyla</i>), Duellman, 1972	<i>S. epacrorrhina</i>
<i>eringiophila</i> (<i>Hyla strigilata</i>), Gallardo, 1961	<i>S. x-signata</i>
<i>eurydice</i> (<i>Hyla</i>), Bokermann, 1968	<i>S. eurydice</i>
<i>evelynae</i> (<i>Hyla</i>), Schmidt, 1944	<i>S. squalirostris</i>
<i>exigua</i> (<i>Oloolygon</i>), Duellman, 1986	<i>S. exigua</i>
<i>fiebrigi</i> (<i>Hyla</i>), Ahl, 1927	<i>S. acuminata</i>
<i>flavoguttata</i> (<i>Hyla</i>), A. Lutz and B. Lutz, 1939	<i>S. flavoguttata</i>
<i>foliamorta</i> (<i>Hyla</i>), Fouquette, 1958	<i>S. rostrata</i>
<i>funerea</i> (<i>Hyla</i>), Cope, 1874	<i>S. funerea</i>
<i>fuscmarginata</i> (<i>Hyla</i>), A. Lutz, 1925	<i>S. fuscmarginata</i>
<i>fuscovaria</i> (<i>Hyla</i>), A. Lutz, 1925	<i>S. fuscovaria</i>
<i>garbei</i> (<i>Garbeana</i>), Miranda-Ribeiro, 1926	<i>S. garbei</i>
<i>goinorum</i> (<i>Hyla</i>), Bokermann, 1962	<i>S. goinorum</i>
<i>granulata</i> (<i>Hyla</i>), Peters, 1871	<i>S. x-signata</i>
<i>hayii</i> (<i>Hyla</i>), Barbour, 1909	<i>S. hayii</i>
<i>heyeri</i> (<i>Oloolygon</i>), Peixoto and Weygoldt, 1986	<i>S. heyeri</i>
<i>hiemalis</i> (<i>Hyla</i>), Haddad and Pombal-Junior, 1987	<i>S. hiemalis</i>
<i>huebneri</i> (<i>Hyla rubra</i>), Melin, 1941	<i>S. rubra</i>
<i>humilis</i> (<i>Hyla</i>), B. Lutz, 1954	<i>S. humilis</i>
<i>inconspicua</i> (<i>Hyla rubra</i>), Melin, 1941	<i>S. funerea</i>
<i>jureia</i> (<i>Hyla</i>), Pombal and Gordo, 1991	<i>S. jureia</i>
<i>kennedyi</i> (<i>Hyla</i>), Pyburn, 1972	<i>S. kennedyi</i>
<i>lateristriga</i> (<i>Hyla</i>), Spix, 1824	<i>S. rubra</i>
<i>lindneri</i> (<i>Hyla</i>), Müller and Hellmich, 1936	<i>S. fuscmarginata</i>
<i>lineomaculata</i> (<i>Hyla</i>), Werner, 1899	<i>S. rubra</i>
<i>littoralis</i> (<i>Hyla</i>), Pombal and Gordo, 1991	<i>S. littoralis</i>
<i>littorea</i> (<i>Hyla</i>), Peixoto, 1988	<i>S. littorea</i>
<i>longilinea</i> (<i>Hyla</i>), B. Lutz, 1968	<i>S. longilinea</i>
<i>lutzii</i> (<i>Hyla</i>), Melin, 1941	<i>S. garbei</i>

Trivial name. Original combination, Author, and Date	Current status
<i>machadoi</i> (<i>Hyla</i>), Bokermann and Sazima, 1973	<i>S. machadoi</i>
<i>madeirae</i> (<i>Hyla</i>), Bokermann, 1964	<i>S. fuscomarginata</i>
<i>maracaya</i> (<i>Hyla</i>), Cardoso and Sazima, 1980	<i>S. maracaya</i>
<i>megapodia</i> (<i>Hyla</i>), Miranda-Ribeiro, 1926, 1937	<i>S. fuscovaria</i>
<i>melloi</i> (<i>Oloolygon</i>), Peixoto, 1988	<i>S. melloi</i>
<i>mirim</i> (<i>Hyla</i>), B. Lutz, 1973	<i>S. rizibilis</i>
<i>nasica</i> (<i>Hyla</i>), Cope, 1862	<i>S. nasica</i>
<i>nebulosa</i> (<i>Hyla</i>), Spix, 1824	<i>S. nebulosa</i>
<i>nigra</i> (<i>Hyla</i>), Cope, 1887	<i>S. x-signata</i>
<i>obtriangulata</i> (<i>Hyla</i>), B. Lutz, 1973	<i>S. obtriangulata</i>
<i>opalina</i> (<i>Hyla catharinae</i>), B. Lutz, 1968	<i>S. opalina</i>
<i>orientalis</i> (<i>Hyla rubra</i>), B. Lutz, 1968	<i>S. rubra</i>
<i>pachychrus</i> (<i>Hyla</i>), Miranda-Ribeiro, 1937	<i>S. pachychrus</i>
<i>parkeri</i> (<i>Hyla</i>), Gaige, 1929	<i>S. parkeri</i>
<i>pedromedinae</i> (<i>Oloolygon</i>), Henle, 1991	<i>S. pedromedinae</i>
<i>perpusilla</i> (<i>Hyla</i>), A. Lutz and B. Lutz, 1939	<i>S. perpusilla</i>
<i>phrynoderma</i> (<i>Hyla</i>), Boulenger, 1889	<i>S. acuminata</i>
<i>pickeli</i> (<i>Hyla</i>), A. Lutz and B. Lutz, 1938	<i>S. pachychrus</i>
<i>proboscidea</i> (<i>Hyla</i>), Brongersma, 1933	<i>S. proboscidea</i>
<i>queimadensis</i> (<i>Hyla p[erpusilla]</i>), B. Lutz, 1973	<i>S. v-signata</i>
<i>quinquefasciata</i> (<i>Hyla</i>), Fowler, 1913	<i>S. quinquefasciata</i>
<i>quinquevittata</i> (<i>Hyla</i>), Cope, 1868	<i>S. elaeochroa</i>
<i>ranki</i> (<i>Hyla</i>), Andrade and Cardoso, 1987	<i>S. ranki</i>
<i>rizibilis</i> (<i>Hyla</i>), Bokermann, 1964	<i>S. rizibilis</i>
<i>robersimoni</i> (<i>Hyla</i>), Donoso-Barros, 1965	<i>S. rubra</i>
<i>rostrata</i> (<i>Hyla</i>), Peters, 1863	<i>S. rostrata</i>
<i>rubra</i> (<i>Hyla</i>), Laurenti, 1768	<i>S. rubra</i>
<i>similis</i> (<i>Hyla</i>), Cochran, 1952	<i>S. similis</i>
<i>simplex</i> (<i>Hyla catharinae</i>), B. Lutz, 1968	<i>S. obtriangulata</i>
<i>squalirostris</i> (<i>Hyla</i>), A. Lutz, 1925	<i>S. squalirostris</i>
<i>staufferi</i> (<i>Hyla</i>), Cope, 1865	<i>S. staufferi</i>
<i>strigilata</i> (<i>Hyla</i>), Spix, 1824	<i>S. strigilata</i>
<i>sugillata</i> (<i>Hyla</i>), Duellman, 1973	<i>S. sugillata</i>
<i>trachythorax</i> (<i>Hyla</i>), Müller and Hellmich, 1936	<i>S. trachythorax</i>
<i>trapicheiroi</i> (<i>Hyla</i>), B. Lutz, 1954	<i>S. catharinae</i>
<i>trilineata</i> (<i>Oloolygon</i>), Hoogmoed and Gorzula, 1979	<i>S. trilineata</i>
<i>v-signata</i> (<i>Hyla perpusilla</i>), B. Lutz, 1968	<i>S. v-signata</i>
<i>wandae</i> (<i>Hyla</i>), Pyburn and Fouquette, 1971	<i>S. wandae</i>
<i>x-signata</i> (<i>Hyla</i>), Spix, 1824	<i>S. x-signata</i>